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CENTRAL INTELLIGENCE AGENCY REPORT
INFORMATION FROM
FOREIGN DOCUMENTS OR RADIO BROADCASTS CD NO.

50X1-HUM

COUNTRY	Yugoslavia
SUBJECT	Economic - Forestry
HOW PUBLISHED	Monthly periodical
WHERE PUBLISHED	Belgrade
DATE PUBLISHED	1950
LANGUAGE	Serbo-Croatian

DATE OF INFORMATION 1950

DATE DIST. 15 Jan 1951

NO. OF PAGES 4

SUPPLEMENT TO REPORT NO.

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SOURCE Preradivacka Industrija, Vol I, No 1, 1950.

YUGOSLAVIA'S FOREST ECONOMY

Engr Vlasisavljevic, Engr Suric

Yugoslav forest reserves were exhausted by excessive cutting before World War I, so that lumber stocks had fallen far below the normal average. Almost all existing forest regions were denuded, and even the remnants in the most accessible forests were cut during the occupation. The stripping of coniferous and oak forests was especially great. Regions where exploitation was difficult because of the terrain, and less valuable timber, such as beech, were stripped less. Certain areas of virgin forests, far from public transportation or where the terrain would involve heavy capital investment, were also less denuded.

The depletion of the Yugoslav forest economy dictated the opening of new forest regions for orderly exploitation and reorientation of the lumber industry for producing raw material.

The requirements for reconstruction and rapid development of industry do not yet permit a decrease in the cutting of forests. The total cutting is as great as before the war, but this does not injure the forests, for cutting has not increased intensively in any one area but rather extensively with the opening of new forests in which large, nonrevenue-producing stores of timber have accumulated.

In addition to the state enterprises, peasants still cut timber for their own use and for retail trade. The ratio of cutting done by peasants and state enterprises from 1947 to 1949 was (in percent):

	<u>State Enterprises</u>	<u>Peasants for Their Own Use</u>
1947	39	61
1948	51	49
1949	59	41

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This ratio shows a substantial change from the years before the plan, when cutting by peasants for their own needs amounted to an average of 66 percent of the total cutting done. This ratio has changed mainly because cutting by the peasants is solely for their own use, while cutting for the retail trade, fuel for cities, wood for artisans, etc., has been taken over by state enterprises. This change in ratio is also due, in smaller measure, to changes in the social structure and to the decreasing peasant population.

State enterprises still exploit conifers to a greater extent than their relative abundance in the forests justifies. Although conifers constitute only 32 percent of the timber stand, 44 percent of all the timber cut in 1947 was evergreen, 52 percent in 1948, 42 percent in 1949, and 39 percent is to be cut in 1950. This disproportion is the result of the great need for lumber for construction in Yugoslavia and the great demand for softwoods in international trade. The increased cutting of evergreens in 1948 was the result of forest fires. The decreases in 1949 and 1950 are the result of the planned reorientation toward hardwoods, particularly beech lumber. The percentage of industrial lumber cut in 1947 was 40 percent, in 1948 45 percent, in 1949 41 percent, and 40 percent is planned for 1950. This percentage is almost constant, except for the increase in 1948, which was a result of the increased cutting of conifers that year.

The method of exploitation has changed considerably, and waste has decreased substantially. Cutting and processing have been mechanized 7 percent by electric chain and circular saws. The hauling of logs to shipping points has been mechanized 6 percent by the use of caterpillar tractors, skids, and portable cableways. Loading has been mechanized 8 percent by the use of portable motor-driven cranes. Loading has also been facilitated by conveyor ramps of Yugoslav construction. The purchase of machinery was expected to increase mechanization by at least 50 percent more, but time will be required for new techniques and work organization to be mastered. Transportation from shipping points has been mechanized 85 percent by forest steam- and motor-driven railroads and trucks, which are a great improvement over the railroad and animal-drawn transportation formerly used.

Lumber is still the chief product of the processing industry. Because of the rapid reconstruction of sawmills damaged during the war, no major technical progress was made in their construction. However, many prewar horizontal-frame saws have been replaced by new ones. Band saws have been introduced, thus making possible more profitable use of raw materials. Partial mechanization of several sawmills has been carried out. One completely mechanized sawmill has been built and another is under construction.

Production of plywood will be increased 50 percent when a new factory in Bosnia is completed, and production of wood-fiber wallboard will be increased 500 percent when the "lesonit" factory is built. A factory for prefabricated wooden houses has been built in Bosnia.

Procurement of machines from abroad for a box factory with a capacity of 30,000 cubic meters of box parts has been concluded. Procurement of assorted machine tools has considerably increased the production of boxes, parquet, and furniture.

The main problems in forestation are the improvement of neglected and run-down forests, the reforestation of uncultivated and barren forest land, and the replacement of inferior with superior varieties and the introduction of new kinds of trees in existing forests. The last step applies particularly to beech forests on the larger hills above the sea, which should be transformed into mixed forests of beech, fir, and juniper. The current forest accretion can be improved by these measures to reach 30 million cubic meters in 50 to 60 years, an accretion more than twice as great as today's measures allow.

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Railroad ties, mine timbers, pulpwood, telephone poles, and wood for making tannin should be produced in forests of local significance wherever possible. Forests of republic significance now furnish wood primarily for mechanical processing, but for very few of the aforementioned items, which as a result are always in critically short supply.

A denser network of hard-surfaced and unsurfaced forest roads should be built. Forest railroads will be abandoned gradually. Forest railroads are a sign of the lag in the general standard of living. For instance, Slovenia, which has the densest network of public transportation, has no forest railroads at all except in one exceptional case.

Yugoslavia makes comparatively little use of wood industrially. Only 24.6 percent of the total amount of wood cut in 1949 was processed for industrial use, and about 3 percent of the industrial wood was exported in the form of raw materials.

Raw materials were processed in Yugoslavia as follows: 89 percent by the sawmill, furniture, plywood, and other industries; 3.6 percent by the cellulose and wood-pulp industry; and 7.4 percent by the dry-distillation and tanning industries. This is not in accord with the current forest structure but rather with that of 30 years ago. The country's needs for cellulose for making paper and textiles necessitate an increase from the current 3.6 percent to at least 20 percent.

The mechanical and chemical processing of lumber should develop as follows: Sawmills need to be modernized, mechanized, and made more efficient. Manpower requirements will thus be cut in half and better use will be made of raw materials. Thus, about 5 percent more and better products will be obtained from the same raw materials. Horizontal-frame saws need to be replaced by band saws, especially for the production of hardwood.

Production of plywood needs to be increased considerably. The introduction of modern machines will permit the use of trees of inferior quality.

The production of boards made of wood fiber or coarse wood particles needs to be increased still more. These boards made of wood waste can replace lumber in making plywood. Production of these boards should be increased from the 0.05 square meter per capita now produced to one square meter per capita.

Production of boxes and barrels needs to be reoriented appreciably. More and more boxes will be needed with industrial progress. Because of the decreased production of softwood, more cardboard and inferior plywood must be used. In view of an imminent shortage of materials for the production of wine barrels, oak staves should be replaced with laminated plywood, which is produced in connection with the production of veneer.

The production of laminated parquet for flooring needs to be started. Laminated parquet requires oak boards only 0.8 centimeter thick instead of the oak boards 2.5 centimeters thick used in regular parquet.

The production of cellulose from beech needs to be developed much more, for Yugoslavia has considerably more beech than conifers.

The capacity of the tanning factories has outstripped the supply of raw materials. These should be increased by developing chestnut forests and cultivating yellowwood forests.

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Wood hydrolysis has not yet been introduced in Yugoslavia. The need for the introduction of this process is increasing, as Yugoslavia will need larger quantities of alcohol if it begins to produce synthetic rubber from alcohol instead of coal.

Production of turpentine and rosin should be increased until the pitch-producing capacity of the coniferous forests is fully exploited. Smaller quantities of these products can still be derived from the distillation of pine logs and as a by-product of cellulose sulfate made from softwood.

An average of 5,600,000 cubic meters of wood per year was cut for export from 1926 to 1939, 4,400,000 cubic meters per year in 1937 and 1938, and 3,400,000 cubic meters per year from 1947 to 1949, or 40 percent less wood was cut in 1947 to 1949 than in 1926 to 1939, and 23 percent less than in 1937 to 1938.

The average value of a ton of exported wood products in 1937 - 1938 was 785 dinars, and 2,400 dinars in 1947 - 1949. This indicates that the price of wood had tripled. The average price of a ton of exported wood products in 1937 - 1938 was 2,765 dinars, as compared with the average price of 1,615 dinars in 1947 - 1949. The lower average prices in the postwar period indicate a considerable change in the type and variety of products exported. For instance, beech firewood and pulpwood averaged 19 percent (by weight) of all wood exported in 1937 - 1938, and 36.4 percent in 1947 - 1949. As a result, relatively less lumber was exported: 16.1 percent of deciduous lumber in 1937 - 1938, as compared with 12.4 percent in 1947 - 1949, and 31.9 percent of coniferous lumber in 1937 - 1938 as compared with 23.6 percent in 1947 - 1949.

The export of some valuable varieties has been reduced perceptibly because of increased domestic consumption. About 75 percent of all the tannin extracted was exported before the war. Today, Yugoslavia absorbs almost the total production in its leather industry. The export of charcoal has also decreased, since Yugoslav metallurgical and metal industries use it in larger quantities. Much less lumber is exported, as it is used for building factories, electric power plants, railroad tracks, roads, and housing. On the other hand, the export of firewood has increased, as Yugoslavia is replacing wood with coal for fuel.

Yugoslavia should stop exporting unprocessed forestry products, as most of these can be processed in Yugoslavia. Forestry products average one fourth of all the wood exported in value, and one half of all the wood exported in volume. An average of 64 percent of the unprocessed wood products exported consisted of lumber. The export of lumber should be decreased considerably, while the export of finished products such as furniture, plywood, and synthetic wood needs to be increased.

Since the cutting of forests must be decreased, wood exports must be decreased about one half in volume, although not necessarily in value. Decreased imports of products which Yugoslavia can produce must also be considered. By producing about 30,000 tons of artificial fibers, one billion dinars could be saved. Increased production of cellulose, paper, rosin, and turpentine will decrease imports by about 500 million dinars. The import of rubber can be decreased if Yugoslavia introduces the production of synthetic rubber made of wood alcohol.

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